

## CLAIMS

Having thus described our invention, what we claim  
as new and desire to secure by Letters Patent is as  
5 follows:

1. A method of at least one of assigning and reusing  
frequencies between one or more communication systems,  
comprising the steps of:

10 configuring a first satellite spot beam having a  
first set of frequencies associated therewith and  
comprising a first substantially central portion  
and a first plurality of subareas, each of the  
first plurality of subareas extending substantially  
15 from a periphery of the first substantially central  
portion to substantially near a circumference of  
the first satellite spot beam;

configuring a second satellite spot beam having a  
second set of frequencies associated therewith and  
20 comprising a second substantially central portion  
and a second plurality of subareas, each of the  
second plurality of subareas extending  
substantially from a periphery of the second

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central portion to substantially near a  
circumference of the second satellite spot beam;  
configuring at least one terrestrial cell that at  
least partially overlaps the first satellite spot  
beam having a third set of frequencies associated  
therewith; and

at least one of assigning, reusing and borrowing, by  
the terrestrial system, at least one of a portion  
of the second set of frequencies and a portion of  
the first set of frequencies used in the first  
central portion, responsive to predetermined  
criteria associated with the third set of  
frequencies, including at least one of assigning,  
reusing and borrowing at least one of the second  
set of frequencies when the second set of  
frequencies are at least substantially  
geographically distant from the first satellite  
spot beam.

2. The method of claim 1 wherein the first plurality  
of subareas are substantially equal sized cells having a  
first size and the second plurality of subareas are  
substantially equal sized cells having a second size.

3. The method of claim 2 wherein the first size and the second size are approximately equal.

4. The method of claim 1 wherein the second set of frequencies are substantially distant from the first satellite spot beam when they are at least one of assigned, reused and borrowed for use in those first plurality of subareas not sharing a common boundary with the second satellite spot beam.

5. The method of claim 1 wherein the first set of frequencies used in the first central portion comprise at least one of those frequency sets respectively associated with satellite spot beams directly adjacent to the first satellite spot beam.

6. The method of claim 1 wherein said step of assigning, reusing and borrowing is based on prioritization rules.

7. The method of claim 6 wherein the prioritization rules include dynamic load and capacity constraints of cells that frequencies are taken from.

8. The method of claim 1 wherein a subscriber terminal positioned within the first central portion can be assigned, reuse and/or borrow use any of the respective set of frequencies associated with the at least one second satellite spot beam.

9. The method of claim 1 wherein a subscriber terminal positioned within the first central portion can be assigned, reuse and/or borrow use any of the respective set of frequencies associated with any spot beams adjacent the first satellite spot beam.

10. The method of claim 1 wherein a subscriber terminal positioned within a subarea of the first spot beam not sharing at least a portion of a common boundary with the second satellite spot beam can be assigned, reuse and/or borrow any of the second set of frequencies associated with the second satellite spot beam.

11. The method of claim 1 wherein the predetermined criteria is at least one of load balancing, maintaining a reserve of frequencies, and received signal strength interference.

12. The method of claim 1 further comprising the steps of:

configuring a second terrestrial cell that at least partially overlaps the second satellite spot beam having a fourth set of frequencies associated therewith; and

at least one of assigning, reusing and borrowing, by the second terrestrial cell, at least one of the first set of frequencies and the frequencies used in the second central portion, responsive to predetermined criteria associated with the fourth set of frequencies, including at least one of assigning, reusing and borrowing at least one of the first set of frequencies when the first set of frequencies are at least substantially geographically distant from the second satellite spot beam.

13. The method of claim 1 wherein the first central portion and the second central portion comprise approximately twenty five percent of the area covered by the first satellite spot beam and the second satellite spot beam, respectively.

14. The method of claim 1 wherein the first set of frequencies and the second set of frequencies comprise a plurality of paired uplink and downlink frequencies.

5 15. The method of claim 14 wherein a downlink frequency of a frequency set is used in a first subarea of the first spot beam, and wherein a corresponding one of the uplink frequencies is reused in a second subarea of the first spot beam.

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16. The method of claim 1 wherein the area of coverage of a spot beam comprises an area having a radius substantially equal to a distance from a center of the spot beam having a substantially maximum signal strength to a distance from the center of the spot beam where the signal strength of the spot beam is attenuated by approximately 3 dB.

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17. The method of claim 1 wherein an area of coverage of at least one of a spot beam and a terrestrial cell comprises an area corresponding to a bit error rate in the range of at least one of  $10^{-2}$  to  $10^{-3}$  for voice and  $10^{-5}$  to  $10^{-6}$  for data.

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18. The method of claim 1 wherein the number of subareas is equal to a number of spot beams comprising a cluster minus one.

5 19. A method of making a telephone call using a satellite-terrestrial communications system that at least one of assigns and reuses frequencies between a first satellite spot beam and a second satellite spot beam, comprising the steps of:

10 a first user using a subscriber terminal to dial a telephone number within an area of a first terrestrial cell associated with a first satellite spot beam having a first set of frequencies associated therewith, the first satellite spot beam comprising a first substantially central portion and a first plurality of subareas, each of the

15 first plurality of subareas extending substantially from a periphery of the first substantially central portion to substantially near a circumference of the first satellite spot beam;

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determining because of at least one of unavailability of the first set of frequencies or weak signal strength that a connection cannot be established, using the first set of frequencies, with a

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communications device having the dialed telephone  
number associated therewith;  
configuring a second satellite spot beam having a  
second set of frequencies associated therewith; and  
5 establishing a connection between the subscriber  
terminal and the communications device by at least  
one of assigning, reusing and borrowing, by the  
first spot beam, at least one of the second set of  
frequencies, responsive to predetermined criteria  
10 including at least one of assigning, reusing and  
borrowing at least one of the second set of  
frequencies when the mobile terminal is  
substantially geographically distant from the  
second satellite spot beam.

20. A method of at least one of assigning and reusing  
frequencies, comprising the steps of:

configuring a first communications area having a  
first set of frequencies associated therewith and  
20 comprising a first substantially central portion  
and a first plurality of subareas, each of the  
first plurality of subareas extending substantially  
from a periphery of the first substantially central

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portion to substantially near a circumference of.  
the first communications area;

configuring a second communications area having a  
second set of frequencies associated therewith and  
5 comprising a second substantially central portion  
and a second plurality of subareas, each of the  
second plurality of subareas extending  
substantially from a periphery of the central  
portion to substantially near a circumference of  
10 the second communications area;

configuring at least one third communications area  
that at least partially overlaps the first  
communications area, having a third set of  
frequencies associated therewith; and  
15 at least one of assigning, reusing and borrowing, by  
the third communications area, at least one of a  
portion of the second set of frequencies and a  
portion of the first set of frequencies used in the  
first central portion, responsive to predetermined  
20 criteria associated with the third set of  
frequencies, including at least one of assigning,  
reusing and borrowing at least one of the second  
set of frequencies when the second set of  
frequencies are at least substantially

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geographically distant from the first satellite  
spot beam.

21. The method of claim 20 wherein the first  
5 plurality of subareas are substantially equal sized  
cells having a first size and the second plurality of  
subareas are substantially equal sized cells having a  
second size.

10 22. The method of claim 21 wherein the first size and  
the second size are approximately equal.

15 23. The method of claim 20 wherein the second set of  
frequencies are substantially distant from the second  
communications area when they are at least one of  
assigned, reused and borrowed for use in those first  
plurality of subareas not sharing a common boundary with  
the second communications area.

20 24. The method of claim 20 wherein the first set of  
frequencies used in the first central portion comprise  
at least one of those frequency sets respectively  
associated with communication areas external to and  
directly adjacent to the first communications area.

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25. The method of claim 20 wherein said step of assigning, reusing and borrowing is based on prioritization rules.

5        26. The method of claim 25 wherein the prioritization rules include dynamic load and capacity constraints of candidate cells that frequencies are being taken from.

10       27. The method of claim 20 wherein a user positioned within the first central portion can be assigned, reuse and/or borrow use any of the respective set of frequencies associated with the at least one second satellite spot beam.

15       28. The method of claim 20 wherein a user positioned within the first central portion can be assigned, reuse and/or borrow use any of the respective set of frequencies associated with any communication areas adjacent the first satellite spot beam.

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29. The method of claim 20 wherein a user positioned within a subarea not sharing at least a portion of a common boundary with the second communications area can be assigned, reuse and/or borrow any of the second set

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of frequencies associated with the second communications area.

5 30. The method of claim 20 wherein the predetermined criteria is at least one of load balancing, maintaining a reserve of frequencies, and received signal strength interference.

10 31. The method of claim 20 further comprising the steps of:

configuring a fourth communications area within the second communications area having a fourth set of frequencies associated therewith; and

15 at least one of assigning, reusing and borrowing, by the fourth communications area, at least one of the first set of frequencies and the frequencies used in the second central portion, responsive to predetermined criteria associated with the fourth set of frequencies, including at least one of  
20 assigning, reusing and borrowing at least one of the first set of frequencies when the first set of frequencies are at least substantially geographically distant from the second communications area.

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32. The method of claim 20 wherein the first central portion and the second central portion comprise approximately twenty five percent of the area covered by the first communications area and the second communications area, respectively.

33. The method of claim 20 wherein the first and second set of frequencies comprise a plurality of paired uplink and downlink frequencies, wherein a downlink frequency of a frequency set is used in a first subarea of the first communications area, and wherein a corresponding one of the uplink frequencies is reused in a second subarea of the first communications area.

34. The method of claim 20 wherein the area of coverage of a communications area comprises an area having a radius substantially equal to a distance from a center of the communications area having a substantially maximum signal strength to a distance from the center of the communications area where the signal strength of the communications area is attenuated by approximately 3 dB.

35. The method of claim 20 wherein an area of coverage of at least one of a spot beam and a terrestrial cell comprises an area corresponding to a bit error rate in the range of at least one of  $10^{-2}$  to  $10^{-3}$  for voice and  $10^{-5}$  to  $10^{-6}$  for data.

36. A method of at least one of assigning and reusing frequencies between one or more communication systems, comprising the steps of:

10 configuring a first satellite spot beam having a first set of frequencies associated therewith and comprising a first substantially central portion and a first plurality of subareas, each of the first plurality of subareas extending substantially from a periphery of the first substantially central portion to substantially near a circumference of the first satellite spot beam;

15 configuring a second satellite spot beam having a second set of frequencies associated therewith and comprising a second substantially central portion and a second plurality of subareas, each of the second plurality of subareas extending substantially from a periphery of the central

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portion to substantially near a circumference of  
the second satellite spot beam;

configuring at least one terrestrial cell that at  
least partially overlaps the first satellite spot  
beam having a third set of frequencies associated  
therewith; and

at least one of assigning, reusing and borrowing, by  
the second satellite spot beam, at least one of a  
portion of the third set of frequencies responsive  
to predetermined criteria, including at least one  
of assigning, reusing and borrowing at least one of  
the third set of frequencies associated with the at  
least one terrestrial cell when the terrestrial  
cell is at least substantially geographically  
distant from the second set of frequencies.

37. A method of at least one of assigning and reusing  
frequencies between one or more communication systems,  
comprising the steps of:

configuring a first satellite spot beam having a  
first set of frequencies associated therewith and  
comprising a first substantially central portion  
and a first plurality of subareas, each of the  
first plurality of subareas extending substantially

from a periphery of the first substantially central portion to substantially near a circumference of the first satellite spot beam;

configuring a second satellite spot beam having a

5 second set of frequencies associated therewith;

configuring at least one terrestrial cell that at

least partially overlaps the first satellite spot beam having a third set of frequencies associated therewith; and

10 at least one of assigning, reusing and borrowing, by the terrestrial cell, at least one of a portion of the second set of frequencies and a portion of the first set of frequencies used in the first central portion, responsive to predetermined criteria  
15 associated with the third set of frequencies, including at least one of assigning, reusing and borrowing at least one of the second set of frequencies when the second set of frequencies are at least substantially geographically distant from  
20 the terrestrial cell.

38. The method of claim 37 wherein the first plurality of subareas are substantially equal sized.

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39. The method of claim 37 wherein the second set of frequencies are substantially distant from the first satellite spot beam when they are at least one of assigned, reused and borrowed for use in those first plurality of subareas not sharing a common boundary with the second satellite spot beam.

40. The method of claim 37 wherein the first set of frequencies used in the first central portion comprise at least one of those frequency sets respectively associated with one or more satellite spot beams directly adjacent to the first satellite spot beam.

41. The method of claim 37 wherein said step of assigning, reusing and borrowing is based on prioritization rules.

42. The method of claim 41 wherein the prioritization rules include dynamic load and capacity constraints of candidate cells that frequencies are being taken from.

43. The method of claim 37 wherein a user positioned within the first central portion can be assigned, reuse and/or borrow use any of the respective set of

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frequencies associated with the second satellite spot beam.

44. The method of claim 37 wherein a subscriber  
5 terminal positioned within the first central portion can  
be assigned, reuse and/or borrow use any of the  
respective set of frequencies associated with any spot  
beams adjacent the first satellite spot beam.

10 45. The method of claim 37 wherein a subscriber  
terminal positioned within a subarea of the first spot  
beam not sharing at least a portion of a common boundary  
with the second satellite spot beam can be assigned,  
reuse and/or borrow any of the second set of frequencies  
15 associated with the second satellite spot beam.

20 46. The method of claim 37 wherein the predetermined  
criteria is at least one of load balancing, maintaining  
a reserve of frequencies, and received signal strength  
interference.

47. The method of claim 37 further comprising the  
steps of:

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configuring a second terrestrial cell that at least partially overlaps the second satellite spot beam having a fourth set of frequencies associated therewith; and

5 at least one of assigning, reusing and borrowing, by the second terrestrial cell, at least one of the first set of frequencies and the frequencies used in the second central portion, responsive to predetermined criteria associated with the fourth  
10 set of frequencies, including at least one of assigning, reusing and borrowing at least one of the first set of frequencies when the first set of frequencies are at least substantially  
15 geographically distant from the second terrestrial cell.

48. The method of claim 37 wherein the first central portion comprises approximately twenty five percent of the area covered by the first satellite spot beam.

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49. The method of claim 37 wherein the first and second set of frequencies comprise a plurality of paired uplink and downlink frequencies, wherein a downlink frequency of a frequency set is used in a first subarea

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of the first spot beam, and wherein a corresponding one of the uplink frequencies is reused in a second subarea of the first spot beam.

5        50. The method of claim 37 wherein the area of coverage of a spot beam comprises an area having a radius substantially equal to a distance from a center of the spot beam having a substantially maximum signal strength to a distance from the center of the spot beam  
10        where the signal strength of the spot beam is attenuated by approximately 3 dB.

15        51. The method of claim 37 wherein an area of coverage of at least one of a spot beam and a terrestrial cell comprises an area corresponding to a bit error rate in the range of at least one of  $10^{-2}$  to  $10^{-3}$  for voice and  $10^{-5}$  to  $10^{-6}$  for data.

20        52. A method of at least one of assigning and reusing frequencies between one or more communication systems, comprising the steps of:

          configuring a first satellite spot beam having a first set of frequencies associated therewith and comprising a first plurality of subareas, each of

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the first plurality of subareas extending from a substantially center area of the first satellite spot beam to substantially near a circumference of the first satellite spot beam in a fan-like manner thereby forming the first plurality of subareas; configuring a second satellite spot beam having a second set of frequencies associated therewith; configuring at least one terrestrial cell that at least partially overlaps the first satellite spot beam having a third set of frequencies associated therewith; and at least one of assigning, reusing and borrowing, by the at least one terrestrial cell, at least one of a portion of the second set of frequencies and a portion of the first set of frequencies used in the first central portion, responsive to predetermined criteria associated with the third set of frequencies for communication therewith, including at least one of assigning, reusing and borrowing at least one of the second set of frequencies when the second set of frequencies are at least substantially geographically distant from the first spot beam.

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53. The method of claim 52 wherein the first plurality of subareas are substantially equal sized.

54. The method of claim 52 wherein the second set of frequencies are substantially distant from the second satellite spot beam when they are at least one of assigned, reused and borrowed for use in those first plurality of subareas not sharing a common boundary with the second satellite spot beam.

55. The method of claim 52 wherein the first set of frequencies used in the first central portion comprise those frequency sets respectively associated with at least one of the satellite spot beams directly adjacent to the first satellite spot beam.

56. The method of claim 52 wherein said step of assigning, reusing and borrowing is based on prioritization rules.

57. The method of claim 56 wherein the prioritization rules include dynamic load and capacity constraints of candidate cells that frequencies are being taken from.

58. The method of claim 56 wherein the prioritization rules further include at least one of signal strength and quality of service.

5 59. The method of claim 52 wherein a user positioned within the first central portion can be assigned, reuse and/or borrow use any of the respective set of frequencies associated with the second satellite spot beam.

10 60. The method of claim 52 wherein a user positioned within the first central portion can be assigned, reuse and/or borrow use any of the respective set of frequencies associated with any spot beams adjacent the first satellite spot beam.

15 61. The method of claim 52 wherein a user positioned within a subarea not sharing at least a portion of a common boundary with the second satellite spot beam can be assigned, reuse and/or borrow any of the second set of frequencies associated with the second satellite spot beam.

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62. The method of claim 52 wherein the predetermined criteria comprise at least one of load balancing, maintaining a reserve of frequencies, and received signal strength interference.

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63. The method of claim 52 further comprising the steps of:

configuring a terrestrial cell that at least

partially overlaps the second satellite spot beam having a fourth set of frequencies associated therewith; and

at least one of assigning, reusing and borrowing, by the terrestrial cell, at least one of the first set of frequencies and the frequencies used in the second central portion, responsive to predetermined criteria associated with the fourth set of frequencies, including at least one of assigning, reusing and borrowing at least one of the first set of frequencies when the first set of frequencies are at least substantially geographically distant from the terrestrial cell.

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64. The method of claim 52 wherein the first and second set of frequencies comprise a plurality of paired uplink and downlink frequencies.

5        65. The method of claim 64 wherein a downlink frequency of a frequency set is used in a first subarea of the first spot beam, and wherein a corresponding one of the uplink frequencies is used in a second subarea of the first spot beam.

10        66. The method of claim 52 wherein the area of coverage of a spot beam comprises an area having a radius substantially equal to a distance from a center of the spot beam having a substantially maximum signal strength to a distance from the center of the spot beam  
15        where the signal strength of the spot beam is attenuated by approximately 3 dB.

20        67. The method of claim 52 wherein an area of coverage of at least one of a spot beam and a terrestrial cell comprises an area corresponding to a bit error rate in the range of  $10^{-2}$  to  $10^{-3}$  for voice and  $10^{-5}$  to  $10^{-6}$  for data.

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68. A system for at least one of assigning and reusing frequencies between one or more communication systems, comprising:

at least one satellite capable of configuring: a) a

5 first spot beam having a first set of frequencies associated therewith, the first spot beam comprising a first substantially central portion and a first plurality of subareas, each of the first plurality of subareas extending substantially from a periphery of the first substantially central portion to substantially near a circumference of the first satellite spot beam, and b) a second satellite spot beam having a second set of frequencies associated therewith, the second spot beam comprising a second substantially central portion and a second plurality of subareas, each of the second plurality of subareas extending substantially from a periphery of the second central portion to substantially near a circumference of the second satellite spot beam;

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20 a terrestrial base station positioned within the first satellite spot beam for configuring a terrestrial cell having at least partially overlapping coverage with the first spot beam, the

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terrestrial cell having a third set of frequencies associated therewith and an area coverage at least partially overlapping with an area of coverage associated with the first spot beam;

- 5 a first subscriber terminal positioned within the terrestrial base station area of coverage; and
- a network operations center (NOC) for at least one of assigning, reusing and borrowing, by the terrestrial base station and for use by said first subscriber terminal in communicating with at least one of a second subscriber terminal and other communications device, at least one of a portion of the second set of frequencies and a portion of the first set of frequencies used in the first central portion, responsive to predetermined criteria
- 10 associated with the third set of frequencies, including at least one of assigning, reusing and borrowing at least one of the second set of frequencies when the second set of frequencies are
- 15 at least substantially geographically distant from the second satellite spot beam.
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69. The system of claim 68 wherein the first plurality of subareas are substantially equal sized and

having a first size, and the second plurality of subareas are substantially and having a second size.

5 70. The system of claim 69 wherein the first size and the second size are approximately equal.

10 71. The system of claim 68 wherein the second set of frequencies are substantially distant from the second satellite spot beam when they are at least one of assigned, reused and borrowed for use by subscriber terminals positioned in those first plurality of subareas not sharing a common boundary with the second satellite spot beam.

15 72. The system of claim 68 wherein the first set of frequencies used by subscriber terminals positioned in the first central portion comprise at least one of those frequency sets respectively associated with one or more satellite spot beams directly adjacent to the first  
20 satellite spot beam.

73. The system of claim 68 wherein at least one of assigning, reusing and borrowing is based on prioritization rules.

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74. The system of claim 73 wherein the prioritization rules include dynamic load and capacity constraints of cells that frequencies are taken from.

5        75. The system of claim 68 wherein a subscriber terminal positioned within the first central portion can be assigned, reuse and/or borrow any of the respective set of frequencies associated with the at least one second satellite spot beam.

10       76. The system of claim 68 wherein a subscriber terminal positioned within the first central portion can be assigned, reuse and/or borrow use any of the respective set of frequencies associated with any spot beam directly adjacent the first satellite spot beam.

15       77. The system of claim 68 wherein a subscriber terminal positioned within a subarea of the first spot beam not sharing at least a portion of a common boundary with the second satellite spot beam can be assigned, reuse and/or borrow any of the second set of frequencies associated with the second satellite spot beam.

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78. The system of claim 68 wherein the predetermined criteria is at least one of load balancing, maintaining a reserve of frequencies, and received signal strength interference.

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79. The system of claim 68 further comprising:

a second terrestrial base station positioned within the second satellite spot beam and having at least partially overlapping coverage with the first spot beam, for configuring at least one terrestrial cell therein, wherein the terrestrial cell has a fourth set of frequencies associated therewith; and

at least one of assigning, reusing and borrowing, by said second terrestrial base station, at least one of the first set of frequencies and the frequencies used in the second central portion, responsive to predetermined criteria associated with the fourth set of frequencies for establishing communication between the second subscriber unit positioned within an area of coverage of said second base station and at least one of the first subscriber terminal and other communications device, including at least one of assigning, reusing and borrowing at least one of the first set of frequencies when the

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first set of frequencies are at least substantially geographically distant from the second satellite spot beam.

5        80. The system of claim 68 wherein the first central portion and the second central portion comprise approximately twenty five percent of the area covered by the first satellite spot beam and the second satellite spot beam, respectively.

10        81. The system of claim 68 wherein the first and second set of frequencies comprise a plurality of paired uplink and downlink frequencies.

15        82. The system of claim 81 wherein a downlink frequency of a frequency set is used in a first subarea of the first spot beam, and wherein a corresponding one of the uplink frequencies is reused in a second subarea of the first spot beam.

20        83. The system of claim 68 wherein the area of coverage of a spot beam comprises an area having a radius substantially equal to a distance from a center of the spot beam having a substantially maximum signal

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strength to a distance from the center of the spot beam where the signal strength of the spot beam is attenuated by approximately 3 dB.

5        84. The system of claim 68 wherein an area of coverage of at least one of a spot beam and a terrestrial cell comprises an area corresponding to a bit error rate in the range of  $10^{-2}$  to  $10^{-3}$  for voice and  $10^{-5}$  to  $10^{-6}$  for data.

10        85. The system of claim 68 wherein the number of subareas is equal to a number of spot beams comprising a cluster minus one.

15        86. A system for making a telephone call using a satellite-terrestrial communications system that at least one of assigns and reuses frequencies between a first satellite spot beam and a second satellite spot beam, comprising:

20        a subscriber terminal for dialing a telephone number to communicate with at least a second communications device;

      a first terrestrial cell having said subscriber terminal positioned therein;

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at least one satellite for configuring: a) a first  
satellite spot beam associated with said first  
terrestrial cell and having a first set of  
frequencies associated therewith, the first  
5 satellite spot beam comprising a first  
substantially central portion and a first plurality  
of subareas, each of the first plurality of  
subareas extending substantially from a periphery  
of the first substantially central portion to  
10 substantially near a circumference of the first  
satellite spot beam, and b) a second satellite spot  
beam having the second communications device  
positioned therein and a second set of frequencies  
associated therewith; and

15 a network operations controller that establishes a  
connection between the subscriber terminal and at  
least the second communications device, by at least  
one of assigning, reusing and borrowing, by the  
first spot beam, at least one of the second set of  
20 frequencies, responsive to predetermined criteria  
including at least one of assigning, reusing and  
borrowing at least one of the second set of  
frequencies when the subscriber terminal is

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substantially geographically distant from the  
second satellite spot beam.

87. A system for use in at least one of assigning and  
5 reusing frequencies, comprising:

at least a first satellite for: a) configuring a  
first communications area having a first set of  
frequencies associated therewith, the  
communications area comprising a first  
10 substantially central portion and a first plurality  
of subareas, each of the first plurality of  
subareas extending substantially from a periphery  
of the first substantially central portion to  
substantially near a circumference of the first  
15 communications area, and for b) configuring a  
second communications area having a second set of  
frequencies associated therewith and comprising a  
second substantially central portion and a second  
plurality of subareas, each of the second plurality  
20 of subareas extending substantially from a  
periphery of the central portion to substantially  
near a circumference of the second communications  
area;

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a terrestrial base station positioned within the first communications area and having at least partially overlapping coverage with the first communications area, that configures at least a third communications area within the first communications area, the third communications area having a third set of frequencies associated therewith; and

a network operations controller that at least one of assigns, reuses and borrows, by said terrestrial base station, at least one of a portion of the second set of frequencies and a portion of the first set of frequencies used in the first central portion for facilitating communications between a subscriber terminal positioned within the first communications area and a second communications device, and responsive to predetermined criteria associated with the third set of frequencies, including at least one of assigning, reusing and borrowing at least one of the second set of frequencies when the second set of frequencies are at least substantially geographically distant from the first satellite spot beam.

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88. The system of claim 87 wherein the first plurality of subareas are substantially equal sized and having a first size and the second plurality of subareas are substantially equal sized and having a second size.

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89. The system of claim 88 wherein the first size and the second size are approximately equal.

90. The system of claim 87 wherein the second set of frequencies are substantially distant from the second communications area when they are at least one of assigned, reused and borrowed for use in those first plurality of subareas not sharing a common boundary with the second communications area.

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91. The system of claim 87 wherein the first set of frequencies used in the first central portion comprise those frequency sets respectively associated with communication areas external to and directly adjacent to the first communications area.

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92. The system of claim 87 wherein the assigning, reusing and borrowing is based on prioritization rules.

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93. The system of claim 92 wherein the prioritization rules comprise dynamic load and capacity constraints of candidate cells that frequencies are being taken from.

5        94. The system of claim 87 wherein a user positioned within the first central portion can be assigned, reuse and/or borrow use any of the respective set of frequencies associated with the second communications area.

10        95. The system of claim 87 wherein when the subscriber terminal is positioned within the first central portion it can be assigned, reuse and/or borrow any of the respective set of frequencies associated with any communication areas adjacent the first  
15        communications area.

20        96. The system of claim 87 wherein when the subscriber terminal is positioned within a subarea of the first communications area not sharing at least a portion of a common boundary with the second communications area it can be assigned, reuse and/or borrow any of the second set of frequencies associated with the second communications area.

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97. The system of claim 87 wherein the predetermined criteria is at least one of load balancing, maintaining a reserve of frequencies, and received signal strength interference.

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98. The system of claim 87, further comprising:

a second terrestrial base station positioned within the second communications area and having at least partially overlapping coverage with the second communications area, wherein the second communications area comprises at least one terrestrial cell within the second communications area, and wherein said second terrestrial base station has a fourth set of frequencies associated therewith; and

at least one of assigning, reusing and borrowing, by said second terrestrial base station, at least one of the first set of frequencies and the frequencies used in the second central portion, responsive to predetermined criteria associated with the fourth set of frequencies, for establishing communication between a second subscriber unit positioned within an area covered by said second terrestrial base station and at least one of the first subscriber

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unit and the second communication device, including  
at least one of assigning, reusing and borrowing at  
least one of the first set of frequencies when the  
first set of frequencies are at least substantially  
5 geographically distant from the second terrestrial  
base station.

99. The system of claim 87 wherein the first central  
portion and the second central portion comprise  
10 approximately twenty five percent of the area covered by  
the first communications area and the second  
communications area, respectively.

100. The system of claim 87 wherein the first and  
15 second set of frequencies comprise a plurality of paired  
uplink and downlink frequencies, wherein a downlink  
frequency of a frequency set is used in a first subarea  
of the first communications area, and wherein a  
corresponding one of the uplink frequencies is reused in  
20 a second subarea of the first communications area.

101. The system of claim 87 wherein the area of  
coverage of a communications area comprises an area  
having a radius substantially equal to a distance from a

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center of the communications area having a substantially maximum signal strength to a distance from the center of the communications area where the signal strength of the communications area is attenuated by approximately 3 dB.

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102. The system of claim 87 wherein an area of coverage of at least one of a spot beam and a terrestrial cell comprises an area corresponding to a bit error rate in the range of  $10^{-2}$  to  $10^{-3}$  for voice and  $10^{-5}$  to  $10^{-6}$  for data.

103. A system for at least one of assigning and reusing frequencies between a plurality of communication systems, comprising:

at least one satellite capable of: a) configuring a first satellite spot beam having a first set of frequencies associated therewith and comprising a first substantially central portion and a first plurality of subareas, each of the first plurality of subareas extending substantially from a periphery of the first substantially central portion to substantially near a circumference of the first satellite spot beam, and b) configuring a second satellite spot beam having a second set of

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frequencies associated therewith and comprising a second substantially central portion and a second plurality of subareas, each of the second plurality of subareas extending substantially from a periphery of the central portion to substantially near a circumference of the second satellite spot beam;

a terrestrial base station positioned within the first satellite spot beam and having at least partially overlapping coverage with the first spot beam, for configuring at least one terrestrial cell within the first satellite spot beam having a third set of frequencies associated therewith and having an area of coverage at least partially overlapping with the first satellite spot beam; and

a network operations controller for at least one of assigning, reusing and borrowing, by the second satellite spot beam, at least one of a portion of the third set of frequencies responsive to predetermined criteria, including at least one of assigning, reusing and borrowing at least one of the third set of frequencies associated with the at least one terrestrial cell when the portion is at

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least substantially geographically distant from the second set of frequencies.

104. A system of at least one of assigning and  
5 reusing frequencies between a plurality of communication systems, comprising:

a first satellite capable of: a) configuring a first  
satellite spot beam having a first set of  
frequencies associated therewith and comprising a  
10 first substantially central portion and a first  
plurality of subareas, each of the first plurality  
of subareas extending substantially from a  
periphery of the first substantially central  
portion to substantially near a circumference of  
15 the first satellite spot beam, and b) configuring a  
second satellite spot beam having a second set of  
frequencies associated therewith;

20 a terrestrial base station positioned within the  
first satellite spot beam and having at least  
partially overlapping coverage with the first spot  
beam, for configuring at least one terrestrial cell  
within the first satellite spot beam, the  
terrestrial cell having a third set of frequencies  
associated therewith and having an area of coverage

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at least partially overlapping with an area of coverage of the first satellite spot beam; and a network operations controller for at least one of assigning, reusing and borrowing, by the terrestrial base station for use in establishing communications between a first subscriber terminal positioned within an area of coverage of said terrestrial base station and at least one of a second subscriber terminal and communications device, at least one of a portion of the second set of frequencies and a portion of the first set of frequencies used in the first central portion, responsive to predetermined criteria associated with the third set of frequencies, including at least one of assigning, reusing and borrowing at least one of the second set of frequencies when the second set of frequencies are at least substantially geographically distant from the first satellite spot beam.

105. The system of claim 104 wherein the first plurality of subareas are substantially equal sized.

106. The system of claim 104 wherein the second set of frequencies are substantially distant from the second satellite spot beam when they are at least one of assigned, reused and borrowed for use in those first  
5 plurality of subareas not sharing a common boundary with the second satellite spot beam.

107. The system of claim 104 wherein the first set of frequencies used in the first central portion comprise those frequency sets respectively associated with  
10 satellite spot beams directly adjacent to the first satellite spot beam.

108. The system of claim 104 wherein said step of  
15 assigning, reusing and borrowing is based on prioritization rules.

109. The system of claim 108 wherein the prioritization rules include dynamic load and capacity  
20 constraints of candidate cells that frequencies are being taken from.

110. The system of claim 104 wherein a subscriber terminal positioned within the first central portion can

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be assigned, reuse and/or borrow any of the respective set of frequencies associated with the second satellite spot beam.

5        111. The system of claim 104 wherein a subscriber terminal positioned within the first central portion can be assigned, reuse and/or borrow any of the respective set of frequencies associated with any spot beams adjacent the first satellite spot beam.

10        112. The system of claim 104 wherein a subscriber terminal positioned within a subarea not sharing at least a portion of a common boundary with the second satellite spot beam can be assigned, reuse and/or borrow  
15 any of the second set of frequencies associated with the second satellite spot beam.

20        113. The system of claim 104 wherein the predetermined criteria is at least one of load balancing, maintaining a reserve of frequencies, and received signal strength interference.

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114. The system of claim 104 further comprising:  
a second terrestrial base station positioned within  
the second satellite spot beam and having at least  
partially overlapping coverage with the second spot  
beam, wherein the second satellite spot beam  
further comprises at least one terrestrial cell  
having a fourth set of frequencies associated  
therewith,

wherein said network operations controller  
facilitates at least one of assigning, reusing and  
borrowing, by said second terrestrial base station  
for use with a second subscriber terminal  
positioned within an area covered by said second  
terrestrial base station, at least one of the first  
set of frequencies and the frequencies used in the  
second central portion, responsive to predetermined  
criteria associated with the fourth set of  
frequencies for establishing communication between  
the second subscriber terminal and at least one of  
the first subscriber terminal and communications  
device, including at least one of assigning,  
reusing and borrowing at least one of the first set  
of frequencies when the first set of frequencies

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are at least substantially geographically distant  
from the second satellite spot beam.

115. The system of claim 104 wherein the first  
5 central portion comprises approximately twenty five  
percent of the area covered by the first satellite spot  
beam.

116. The system of claim 104 wherein the first and  
10 second set of frequencies comprise a plurality of paired  
uplink and downlink frequencies, wherein a downlink  
frequency of a frequency set is used in a first subarea  
of the first spot beam, and wherein a corresponding one  
of the uplink frequencies is reused in a second subarea  
15 of the first spot beam.

117. The system of claim 104 wherein an area of  
coverage of at least one of a spot beam and a  
terrestrial cell comprises an area corresponding to a  
20 bit error rate in the range of  $10^{-2}$  to  $10^{-3}$  for voice and  
 $10^{-5}$  to  $10^{-6}$  for data.

118. The system of claim 104 wherein the area of  
coverage of a spot beam comprises an area having a

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radius substantially equal to a distance from a center of the spot beam having a substantially maximum signal strength to a distance from the center of the spot beam where the signal strength of the spot beam is attenuated by approximately 3 dB.

119. A system of at least one of assigning and reusing frequencies between a plurality of communication systems, comprising:

a first satellite capable of: a) configuring a first satellite spot beam having a first set of frequencies associated therewith and comprising a first plurality of subareas, each of the first plurality of subareas extending from a substantially center area of the first satellite spot beam to substantially near a circumference of the first satellite spot beam in a fan-like manner thereby forming the first plurality of subareas, and b) configuring a second satellite spot beam having a second set of frequencies associated therewith;

a terrestrial base station positioned within the first satellite spot beam and having at least partially overlapping coverage with the first spot

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beam, for configuring a terrestrial cell, the  
terrestrial cell having a third set of frequencies  
associated therewith and having an area of coverage  
at least partially overlapping with an area of  
coverage associated with the first spot beam; and  
a network controller for at least one of assigning,  
reusing and borrowing, by said terrestrial base  
station and for use by a first subscriber terminal  
in communicating with at least one of a second  
subscriber terminal or communications device, at  
least one of a portion of the second set of  
frequencies and a portion of the first set of  
frequencies used in the first central portion,  
responsive to predetermined criteria associated  
with the third set of frequencies, including at  
least one of assigning, reusing and borrowing at  
least one of the second set of frequencies when the  
second set of frequencies are at least  
substantially geographically distant from the first  
satellite spot beam.

120. The system of claim 119 wherein the first  
plurality of subareas are substantially equal sized.

121. The system of claim 119 wherein the second set of frequencies are substantially distant from the second satellite spot beam when they are at least one of assigned, reused and borrowed for use in those first  
5 plurality of subareas not sharing a common boundary with the second satellite spot beam.

122. The system of claim 119 wherein the assigning, reusing and borrowing is based on prioritization rules.  
10

123. The system of claim 122 wherein the prioritization rules include dynamic load and capacity constraints of candidate cells that frequencies are being taken from.  
15

124. The system of claim 119 wherein a subscriber terminal positioned within a subarea not sharing at least a portion of a common boundary with the second satellite spot beam can be assigned, reuse and/or borrow  
20 any of the second set of frequencies associated with the second satellite spot beam.

125. The system of claim 119 wherein the predetermined criteria is at least one of load

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balancing, maintaining a reserve of frequencies, and received signal strength interference.

126. The system of claim 119 further comprising:

5 a second terrestrial base station positioned within the second satellite spot beam and having at least partially overlapping coverage with the second spot beam, and associated with a terrestrial cell having a fourth set of frequencies associated therewith; and

10 at least one of assigning, reusing and borrowing, by said second terrestrial base station, at least one of the first set of frequencies and the frequencies used in spot beams adjacent to the second spot beam, responsive to predetermined criteria  
15 associated with the fourth set of frequencies, for establishing communication between a second subscriber terminal positioned within the area of coverage of said second terrestrial base station  
20 and at least one of a subscriber terminal and communications device, including at least one of assigning, reusing and borrowing at least one of the first set of frequencies when the first set of frequencies are at least substantially

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geographically distant from the second satellite spot beam.

127. The system of claim 119 wherein the first and second frequencies comprise a plurality of paired uplink and downlink frequencies, wherein one of the frequency sets is used in a first subarea of the first spot beam, and wherein a corresponding one of the uplink frequencies is reused in a second subarea of the first spot beam.

128. The system of claim 119 wherein an area of coverage of at least one of a spot beam and a terrestrial cell comprises an area corresponding to a bit error rate in the range of  $10^{-2}$  to  $10^{-3}$  for voice and  $10^{-5}$  to  $10^{-6}$  for data.

129. The system of claim 119 wherein the area of coverage of a spot beam comprises an area having a radius substantially equal to a distance from a center of the spot beam having a substantially maximum signal strength to a distance from the center of the spot beam where the signal strength of the spot beam is attenuated by approximately 3 dB.

means positioned within the first satellite spot beam  
for configuring a terrestrial cell having at least  
partially overlapping coverage with the first spot  
beam, the terrestrial cell having a third set of  
frequencies associated therewith and an area

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coverage at least partially overlapping with an area of coverage associated with the first spot beam;

5 a first subscriber terminal positioned within the terrestrial base station area of coverage; and means for at least one of assigning, reusing and borrowing, by the terrestrial base station and for use by said first subscriber terminal in communicating with at least one of a second subscriber terminal and other communications device, at least one of a portion of the second set of frequencies and a portion of the first set of frequencies used in the first central portion, responsive to predetermined criteria associated with the third set of frequencies, including at least one of assigning, reusing and borrowing at least one of the second set of frequencies when the second set of frequencies are at least substantially geographically distant from the second satellite spot beam.

131. A system for making a telephone call using a satellite-terrestrial communications system that at least one of assigns and reuses frequencies between a

first satellite spot beam and a second satellite spot beam, comprising:

a subscriber terminal for dialing a telephone number to communicate with at least a second communications device;

a first terrestrial cell having said subscriber terminal positioned therein;

means for configuring: a) a first satellite spot beam associated with said first terrestrial cell, having a first set of frequencies associated therewith, and having at least partially overlapping coverage with the first terrestrial cell, the first satellite spot beam comprising a first substantially central portion and a first plurality of subareas, each of the first plurality of subareas extending substantially from a periphery of the first substantially central portion to substantially near a circumference of said first satellite spot beam, and b) a second satellite spot beam having the second communications device positioned therein and a second set of frequencies associated therewith; and

means for establishing a connection between said subscriber terminal and at least the second

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communications device, by at least one of  
assigning, reusing and borrowing, by the first spot  
beam, at least one of the second set of  
frequencies, responsive to predetermined criteria  
including at least one of assigning, reusing and  
borrowing at least one of the second set of  
frequencies when the subscriber terminal is  
substantially geographically distant from the  
second satellite spot beam.

132. A system for use in at least one of assigning  
and reusing frequencies, comprising:  
means for configuring: a) a first communications area  
having a first set of frequencies associated  
therewith, the communications area comprising a  
first substantially central portion and a first  
plurality of subareas, each of the first plurality  
of subareas extending substantially from a  
periphery of the first substantially central  
portion to substantially near a circumference of  
the first communications area, and b) a second  
communications area having a second set of  
frequencies associated therewith and comprising a  
second substantially central portion and a second



plurality of subareas, each of the second plurality  
of subareas extending substantially from a  
periphery of the central portion to substantially  
near a circumference of the second communications  
area;

means positioned within the first satellite spot beam  
for configuring at least a third communications  
area within the first communications area, the  
third communications area having a third set of  
frequencies associated therewith and having at  
least partially overlapping coverage with the first  
spot beam; and

means for at least one of assigning, reusing and  
borrowing, by said terrestrial base station, at  
least one of a portion of the second set of  
frequencies and a portion of the first set of  
frequencies used in the first central portion for  
facilitating communications between a subscriber  
terminal positioned within the first spot beam and  
a second communications device, and responsive to  
predetermined criteria associated with the third  
set of frequencies, including at least one of  
assigning, reusing and borrowing at least one of  
the second set of frequencies when the second set

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of frequencies are at least substantially geographically distant from the first satellite spot beam.

5        133. A system for at least one of assigning and reusing frequencies between a plurality of communication systems, comprising:

means for: a) configuring a first satellite spot beam  
10        having a first set of frequencies associated therewith and comprising a first substantially central portion and a first plurality of subareas, each of the first plurality of subareas extending substantially from a periphery of the first substantially central portion to substantially near  
15        a circumference of the first satellite spot beam, and b) configuring a second satellite spot beam having a second set of frequencies associated therewith and comprising a second substantially central portion and a second plurality of subareas,  
20        each of the second plurality of subareas extending substantially from a periphery of the central portion to substantially near a circumference of the second satellite spot beam;

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means positioned within the first satellite spot beam  
for configuring at least one terrestrial cell  
within the first satellite spot beam having a third  
set of frequencies associated therewith and having  
an area of coverage at least partially overlapping  
with the first satellite spot beam; and

means for at least one of assigning, reusing and  
borrowing, by the second satellite spot beam, at  
least one of a portion of the third set of  
frequencies responsive to predetermined criteria,  
including at least one of assigning, reusing and  
borrowing at least one of the third set of  
frequencies associated with the at least one  
terrestrial cell when the portion is at least  
substantially geographically distant from the  
second set of frequencies.

134. A system of at least one of assigning and  
reusing frequencies between a plurality of communication  
systems, comprising:

means for: a) configuring a first satellite spot beam  
having a first set of frequencies associated  
therewith and comprising a first substantially  
central portion and a first plurality of subareas,

each of the first plurality of subareas extending substantially from a periphery of the first substantially central portion to substantially near a circumference of the first satellite spot beam, and b) configuring a second satellite spot beam having a second set of frequencies associated therewith;

means positioned within the first satellite spot beam for configuring at least one terrestrial cell within the first satellite spot beam, the terrestrial cell having a third set of frequencies associated therewith and having an area of coverage at least partially overlapping with an area of coverage of the first satellite spot beam; and means for at least one of assigning, reusing and borrowing, by the terrestrial base station for use in establishing communications between a first subscriber terminal positioned within an area of coverage of said terrestrial base station and at least one of a second subscriber terminal and communications device, at least one of a portion of the second set of frequencies and a portion of the first set of frequencies used in the first central portion, responsive to predetermined criteria

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associated with the third set of frequencies,  
including at least one of assigning, reusing and  
borrowing at least one of the second set of  
frequencies when the second set of frequencies are  
at least substantially geographically distant from  
the first satellite spot beam.

135. A system of at least one of assigning and  
reusing frequencies between a plurality of communication  
systems, comprising:

means for: a) configuring a first satellite spot beam  
having a first set of frequencies associated  
therewith and comprising a first plurality of  
subareas, each of the first plurality of subareas  
extending from a substantially center area of the  
first satellite spot beam to substantially near a  
circumference of the first satellite spot beam in a  
fan-like manner thereby forming the first plurality  
of subareas, and b) configuring a second satellite  
spot beam having a second set of frequencies  
associated therewith;

means positioned within the first satellite spot beam  
for configuring a terrestrial cell, the terrestrial  
cell having a third set of frequencies associated

therewith and having an area of coverage at least partially overlapping with an area of coverage associated with the first spot beam; and means for at least one of assigning, reusing and

5 borrowing, by said terrestrial base station and for use by a first subscriber terminal in communicating with at least one of a second subscriber terminal or communications device, at least one of a portion of the second set of frequencies and a portion of

10 the first set of frequencies used in the first central portion, responsive to predetermined criteria associated with the third set of frequencies, including at least one of assigning, reusing and borrowing at least one of the second

15 set of frequencies when the second set of frequencies are at least substantially geographically distant from the first satellite spot beam.

20 136. A method of at least one of assigning and reusing frequencies between one or more communication systems, comprising the steps of:

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configuring a first satellite spot beam having a  
first set of frequencies associated therewith and  
comprising a first substantially central portion;  
configuring a second satellite spot beam having a  
5 second set of frequencies associated therewith and  
comprising a second substantially central portion  
configuring at least one terrestrial cell within the  
first satellite spot beam having a third set of  
frequencies associated therewith and having at  
10 least partially overlapping coverage with the first  
spot beam; and  
at least one of assigning, reusing and borrowing, by  
the terrestrial system, at least one of a portion  
of the second set of frequencies and a portion of  
15 the first set of frequencies used in the first  
central portion, responsive to predetermined  
criteria associated with the third set of  
frequencies, including at least one of assigning,  
reusing and borrowing at least one of the second  
20 set of frequencies when the second set of  
frequencies are at least substantially  
geographically distant from the first satellite  
spot beam.

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137. The method of claim 136 wherein the second set of frequencies are substantially distant from the first satellite spot beam when they are used in subareas of the second spot beam that do not share a common boundary with the first satellite spot beam.

138. The method of claim 136 wherein the first set of frequencies used in the first central portion comprise at least one of those frequency sets respectively associated with satellite spot beams directly adjacent to the first satellite spot beam.

139. The method of claim 136 wherein said step of assigning, reusing and borrowing is based on prioritization rules.

140. The method of claim 139 wherein the prioritization rules include dynamic load and capacity constraints of cells that frequencies are taken from.

141. The method of claim 136 wherein a subscriber terminal positioned within the first central portion can be assigned, reuse and/or borrow use any of the

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respective set of frequencies associated with the at least one second satellite spot beam.

142. The method of claim 136 wherein a subscriber  
5 terminal positioned within the first central portion can be assigned, reuse and/or borrow use any of the respective set of frequencies associated with any spot beams adjacent the first satellite spot beam.

10 143. The method of claim 136 wherein the predetermined criteria is at least one of load balancing, maintaining a reserve of frequencies, and received signal strength interference.

15 144. The method of claim 136 further comprising the steps of:

20 configuring a second terrestrial cell within the second satellite spot beam having a fourth set of frequencies associated therewith and having at least partially overlapping coverage with the second spot beam; and  
at least one of assigning, reusing and borrowing, by the second terrestrial cell, at least one of the first set of frequencies and the frequencies used

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in the second central portion, responsive to predetermined criteria associated with the fourth set of frequencies, including at least one of assigning, reusing and borrowing at least one of the first set of frequencies when the first set of frequencies are at least substantially geographically distant from the second satellite spot beam.

145. The method of claim 136 wherein the first central portion and the second central portion comprise approximately twenty five percent of the area covered by the first satellite spot beam and the second satellite spot beam, respectively.

146. The method of claim 136 wherein the first set of frequencies and the second set of frequencies comprise a plurality of paired uplink and downlink frequencies, wherein a downlink frequency of a frequency set is used in the first spot beam, and wherein a corresponding one of the uplink frequencies is reused in the second spot beam.

147. The system of claim 137 wherein an area of coverage of at least one of a spot beam and a terrestrial cell comprises an area corresponding to a bit error rate in the range of  $10^{-2}$  to  $10^{-3}$  for voice and  
5  $10^{-5}$  to  $10^{-6}$  for data.

148. The method of claim 136 wherein the area of coverage of a spot beam comprises an area having a radius substantially equal to a distance from a center  
10 of the spot beam having a substantially maximum signal strength to a distance from the center of the spot beam where the signal strength of the spot beam is attenuated by approximately 3 dB.

149. A method of making a telephone call using a satellite-terrestrial communications system that at  
15 least one of assigns and reuses frequencies between a first satellite spot beam and a second satellite spot beam, comprising the steps of:

20 a first user using a subscriber terminal to dial a telephone number within an area of a first terrestrial cell associated with a first satellite spot beam having a first set of frequencies

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associated therewith, the first satellite spot beam comprising a first substantially central portion; determining because of at least one of unavailability of the first set of frequencies or weak signal strength that a connection cannot be established, using the first set of frequencies, with a communications device having the dialed telephone number associated therewith;

configuring a second satellite spot beam having a second set of frequencies associated therewith and having at least partially overlapping coverage with the second spot beam; and

establishing a connection between the subscriber terminal and the communications device by at least one of assigning, reusing and borrowing, by the first spot beam, at least one of the second set of frequencies, responsive to predetermined criteria including at least one of assigning, reusing and borrowing at least one of the second set of frequencies when the mobile terminal is substantially geographically distant from the second satellite spot beam.

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150. A satellite-terrestrial communication system using satellite uplink and downlink frequencies, comprising:

a terrestrial system producing a signal at a

5        satellite uplink frequency that is transmitted to a terrestrial subscriber terminal; and

said terrestrial system receiving a signal at a

satellite downlink frequency that was transmitted

by said terrestrial subscriber terminal.

10  
15        151. The satellite-terrestrial communication system according to claim 150 wherein said terrestrial system includes a signal nulling means in the direction of a satellite that produces signals using said uplink and said downlink frequencies.

152. A satellite-terrestrial communication system using satellite uplink and downlink frequencies comprising:

20        a terrestrial subscriber terminal producing a signal at a satellite downlink frequency that is transmitted to a terrestrial system; and

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said terrestrial subscriber terminal receiving a  
signal at a satellite uplink frequency that was  
transmitted by said terrestrial system.

5        153. The satellite-terrestrial communications system  
of claim 152 wherein a satellite ground user using said  
uplink and downlink frequencies is geographically  
isolated from said terrestrial subscriber terminal.

10        154. A method of integrating a terrestrial  
communication system into a satellite communication  
frequency spectrum comprising the steps of:  
producing a signal at a satellite uplink frequency  
that is transmitted from a terrestrial system to a  
15        terrestrial user terminal; and  
receiving a signal at a satellite downlink frequency  
that was produced by said terrestrial user terminal  
and transmitted to said terrestrial system.

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